

I claim:

1. A fabric filter having a stiffener applied thereto for high temperature gaseous filtration applications, comprising:
 - (a) a fabric material capable of withstanding operating temperatures of at least about 450 degrees Fahrenheit for prolonged periods of time without deformation or deterioration; and
 - (b) a chemical stiffener applied to said fabric material.
2. The fabric filter of Claim 1 wherein said material is fiberglass.
3. The fabric filter of Claim 1 wherein said fabric is woven.
4. The fabric filter of Claim 3 wherein said fabric is woven with fiberglass ECDE yarns.
5. The fabric filter of Claim 1 wherein the stiffener is comprised of resorcinol-formaldehyde resin solution, acrylic resin emulsion, hexamethylenetetramine, and water.
6. The fabric filter of Claim 1 wherein the stiffener is comprised of phenol-formaldehyde resin solution, acrylic resin emulsion, hexamethylenetetramine, and water.
7. The fabric filter of Claim 5 wherein the stiffener is further comprised of ammonia.
8. The fabric filter of Claim 6 wherein the stiffener is further comprises of ammonia.
9. The fabric filter of Claim 5 wherein said chemical stiffener is comprised of about 5 to 40 percent resorcinol-formaldehyde resin solution, about 1 to 10 percent

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acrylic resin emulsion, about 0.1 to 2 percent ammonia, about 0.1 to 5 percent hexamethylenetetramine, and about 43 to 93.8 percent water.

10. The fabric filter of Claim 9 wherein said chemical stiffener is comprised of
5 about 30 percent resorcinol-formaldehyde resin solution, about 5 percent acrylic resin emulsion, about 1.3 percent ammonia, about 2 percent hexamethylenetetramine, and about 61.7 percent water.

11. The fabric filter of Claim 1 further including a first applied lubricant
10 comprised of water and a silicone lubricant.

12. The fabric filter of Claim 1 further including a first applied lubricant comprised of water and a dispersion of polytetrafluorethylene.

13. The fabric filter of Claim 1 further including a first applied lubricant
15 comprised of water, a silicone lubricant, and a dispersion of polytetrafluorethylene.

14. The fabric filter of Claim 13 wherein the first applied lubricant is comprised of
20 about 5 to 50 percent phenol silicon polymer, about 1 to 40 percent polytetrafluorethylene dispersion, and about 10 to 94 percent water.

15. The fabric filter of Claim 1 further including a last applied protective layer comprised of a dispersion of polytetrafluorethylene and water.

16. The fabric filter of Claim 15 wherein the last applied protective layer is
25 comprised of about 5 to 30 percent polytetrafluorethylene dispersion and about 70 to 95 percent water.

17. The fabric filter of Claim 16 wherein the last applied protective layer is
30 comprised of about 20 percent polytetrafluorethylene dispersion and about 80 percent water.

18. The fabric filter of Claim 1 wherein the fabric material is suitable for filtration at temperatures between about 450 degrees Fahrenheit and 550 degrees Fahrenheit.

19. The fabric material of Claim 1 wherein the fabric material is so formed that
5 openings within the fabric are no larger than about 10 microns.

20. The fabric material of Claim 1 wherein the stiffened fabric material is pleated to provide increased filtration area.

10 21. A fibrous fabric filter having a stiffening system applied thereto for maintaining form in high temperature filtration applications, comprising:

(a) a fibrous fabric material capable of withstanding operating temperatures of at least 450 degrees Fahrenheit for prolonged periods of time without deformation or deterioration;

15 (b) a stiffening system comprising:

(i) an inner treatment layer applied to said fibrous fabric material, said inner treatment layer comprising water, a silicone lubricant, and a dispersion of polytetrafluorethylene;

20 (ii) an intermediate treatment layer applied to said inner treatment layer, said intermediate treatment layer comprising resorcinol-formaldehyde resin solution, acrylic resin emulsion, ammonia, hexamethylenetetramine, and water;

25 (iii) an outer treatment layer applied to said intermediate treatment layer, said outer treatment layer comprising a dispersion of polytetrafluorethylene and water; and

(c) the fibrous fabric material being pleated to increase the surface area.

22. The fibrous fabric filter of Claim 21 wherein said fabric is woven with fiberglass ECDE yarns.

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23. The fibrous fabric filter of Claim 21 wherein said inner treatment layer is comprised of about 5 to 50 percent phenol silicon polymer, about 1 to 40 percent polytetrafluorethylene dispersion, and about 10 to 94 percent water.

24. The fibrous fabric filter of Claim 23 wherein said inner treatment layer is comprised of about 30 percent phenol silicon polymer, about 20 percent polytetrafluorethylene dispersion, and about 50 percent water.

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25. The fibrous fabric filter of Claim 21 wherein said intermediate treatment layer is comprised of about 5 to 40 percent resorcinol-formaldehyde resin solution, about 1 to 10 percent acrylic resin emulsion, about 0.1 to 2 percent ammonia, about 0.1 to 5 percent hexamethylenetetramine, and about 43 to 93.8 percent water.

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26. The fibrous fabric filter of Claim 25 wherein said intermediate treatment layer is comprised of about 30 percent resorcinol-formaldehyde resin solution, about 5 percent acrylic resin emulsion, about 1.3 percent ammonia, about 2 percent hexamethylenetetramine, and about 61.7 percent water.

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27. The fibrous fabric filter of Claim 21 wherein said outer treatment layer is comprised of about 5 to 30 percent polytetrafluorethylene dispersion and about 70 to 95 percent water.

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28. The fibrous fabric filter of Claim 27 wherein said outer treatment layer is comprised of about 20 percent polytetrafluorethylene dispersion and about 80 percent water.

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29. The fabric filter of Claim 21 wherein the fabric material is suitable for filtration at temperatures between about 450 degrees Fahrenheit and 550 degrees Fahrenheit.

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30. The fabric filter of Claim 21 wherein the filtration efficiency of the stiffened fabric material is greater than 99 percent for particulate matter of about 10-microns or larger.

31. A filtering device with a fabric filter material for maintaining form in high temperature filtration applications, comprising:

- (a) a perforated liner;
- (b) a fibrous fabric material capable of withstanding operating temperatures of at least 450 degrees Fahrenheit for prolonged periods of time without deformation or deterioration, said fibrous fabric material being pleated and disposed about the area of the perforated liner;
- (c) a chemical stiffener applied to said fabric material; and
- (d) at least one retainer, said retainer for holding the fibrous fabric material in place about said perforated liner.

10 32. The filtering device of Claim 31 wherein said fibrous fabric material is fiberglass.

33. The filtering device of Claim 31 wherein said fibrous fabric is woven.

15 34. The filtering device of Claim 33 wherein said fabric is woven with fiberglass ECDE yarns.

20 35. The filtering device of Claim 31 wherein the chemical stiffener is comprised of resorcinol-formaldehyde resin solution, acrylic resin emulsion, hexamethylenetetramine, and water.

25 36. The filtering device of Claim 31 wherein the chemical stiffener is comprised of phenol-formaldehyde resin solution, acrylic resin emulsion, hexamethylenetetramine, and water.

37. The filtering device of Claim 35 wherein the stiffener is further comprised of ammonia.

30 38. The filtering device of Claim 36 wherein the stiffener is further comprised of ammonia.

39. The filtering device of Claim 36 wherein said chemical stiffener is comprised of about 5 to 40 percent resorcinol-formaldehyde resin solution, about 1 to 10 percent

acrylic resin emulsion, about 0.1 to 2 percent ammonia, about 0.1 to 5 percent hexamethylenetetramine, and about 43 to 93.8 percent water.

40. The filtering device of Claim 39 wherein said chemical stiffener is comprised
5 of about 30 percent resorcinol-formaldehyde resin solution, about 5 percent acrylic resin emulsion, about 1.3 percent ammonia, about 2 percent hexamethylenetetramine, and about 61.7 percent water.

41. The filtering device of Claim 32 further including a first applied lubricant
10 comprised of water and a silicone lubricant.

42. The filtering device of Claim 32 further including a first applied lubricant comprised of water and a dispersion of polytetrafluorethylene.

15 43. The filtering device of Claim 32 further including a first applied lubricant comprised of water, a silicone lubricant, and a dispersion of polytetrafluorethylene.

44. The filtering device of Claim 43 wherein the first applied lubricant is comprised of about 5 to 50 percent phenol silicon polymer, about 1 to 40 percent
20 polytetrafluorethylene dispersion, and about 10 to 94 percent water.

45. The filtering device of Claim 32 further including a last applied protective layer comprised of a dispersion of polytetrafluorethylene and water.

25 46. The filtering device of Claim 45 wherein the last applied protective layer is comprised of about 5 to 30 percent polytetrafluorethylene dispersion and about 70 to 95 percent water.

47. The filtering device of Claim 46 wherein the last applied protective layer is
30 comprised of about 20 percent polytetrafluorethylene dispersion and about 80 percent water.

48. The filtering device of Claim 32 wherein the fabric material is suitable for filtration at temperatures between about 450 degrees Fahrenheit and 550 degrees Fahrenheit.

5 49. The filtering device of Claim 32 wherein the fabric material is so formed that openings within the fabric are no larger than about 10 microns.

50. The filtering device of Claim 32 wherein the stiffened fabric material is pleated to provide increased filtration area.

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51. A method of manufacturing a filter medium for high temperature applications comprising:

- 15 (a) applying an inner treatment layer to a fibrous fabric material, said inner layer comprising water, a silicone lubricant, and a dispersion of polytetrafluorethylene;
- (b) drying said treated fabric material with said inner treatment layer;
- (c) applying an intermediate treatment layer to said fabric material atop said inner treatment layer, said intermediate layer comprising resorcinol-formaldehyde resin solution, acrylic resin emulsion, ammonia, hexamethylenetetramine, and water;
- 20 (d) drying said treated fabric material with said intermediate treatment layer;
- (e) applying an outer treatment layer over said fabric material, said intermediate layer comprising a dispersion of polytetrafluorethylene and water;
- 25 (f) heating said treated fabric material with said outer treatment layer until said outer treatment layer is dry; and
- (g) forming said treated fabric material into a desired shape and curing the treated fabric material until said desired shape is set.

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